REMARKS

Claims 1-8, 10-16, and 21-28 are pending in the application and stand rejected. Applicants respectfully request reconsideration of the claim rejections based on the following remarks.

Claim Rejections - 35 U.S.C. § 103(a):

Claims 1-8 and 21-28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Wallace et al. (U.S. Patent 6,277,681) and the comments stated on page 2 and 3 of the Office action. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. as applied to claims 1-8 and 21-28 above, and further in view of Wolf et al., Vol. 2.

In general, the methods of claims 1, 10, and 21 are related to methods for forming a crystalline silicon nitride layer comprising, *inter alia,* the step of precleaning the exposed surface by employing a hydrogen prebake after an amount of time has elapsed after the removing of a native oxide from the exposed surface.

Applicants respectfully submit that, at the very least, Wallace does not disclose or suggest methods for forming a crystalline silicon nitride layer comprising, *inter alia, the step of precleaning the exposed surface by employing a hydrogen prebake after an amount of time has elapsed after the removing of a native oxide from the exposed surface*, as essentially claimed in claims 1, 10, and 21.

The Examiner contends that Wallace discloses in Col. 2, lines 20-24, a process for precleaning an exposed surface of a substrate by employing a hydrogen prebake. However, it is respectfully submitted that there is nothing in the cited section that discloses or remotely suggests

a hydrogen prebake. In contrast, Wallace discloses a cleaning process including a wet clean process followed by oxidation (chemical or thermal), then followed by a HF-last stripping of the oxide for H-termination (Col. 2, lines 20-24). Wallace also teaches the cleaning can take place by ultra high vacuum (UHV), "flash heating," and cooling to room temperature to form a well-ordered surface. In other words, Wallace discloses a cleaning process including a wet cleaning followed by oxidation, then followed by a HF-last stripping of the oxide and does not disclose precleaning an exposed surface of a substrate by employing a hydrogen prebake.

Indeed, Applicants cannot find in the passage cited by the Examiner nor anywhere else in the cited reference a method for forming a crystalline silicon nitride layer comprising, *inter alia, the step of precleaning the exposed surface by employing a hydrogen prebake after an amount of time has elapsed after the removing of a native oxide from the exposed surface*, as essentially claimed in claims 1, 10, and 21. Thus, Wallace teaches a different claiming process then the cleaning process disclosed in the present invention for at least the reasons stated above.

Further, Examiner correctly acknowledges that Wallace does not disclose a duration of delay between the cleaning steps. However, Examiner contends it would have been a matter of routine optimization. Applicants respectfully disagree.

Applicants respectfully submit that the delay time is not a matter of routine optimization or general conditions of a claim disclosed in the prior art. Indeed, it is an important aspect of the present invention because it effects the type of layer to be formed, e.g., a continuous crystalline layer, a partial crystalline layer, or an amorphous crystalline, see page 12, lines 4-15. Thus, Applicants respectfully submit that the Examiner has no basis for contending "routine optimization" other than impermissive hindsight reasoning based on applicants' disclosure.

Indeed, there is nothing in Wallace that discloses hydrogen prebake, much less time delay between the cleaning steps.

And, therefore, Applicants respectfully submit that claims 1, 10, and 21 are patentably distinct and non-obvious over Wallace for at least the reasons stated above.

Further, with respect to claim 10, in addition to the reasons stated above with respect to claims 1, 10, and 21, claim 10 is believed to be patentably distinct and non-obvious over the combination of Wallace and Wolf because the combination does not teach or suggest *depositing an amorphous silicon nitride layer over the continuous crystalline silicon nitride layer...to form a node dielectric,* as essentially claimed in claim 10.

Examiner contends it would have been within the scope of one of ordinary skill in the art to combine the teachings of Wallace and Wolf to employ the process of Wolf to achieve the capacitor formation step of the combination. Applicants respectfully disagree.

Examiner correctly notes that Wallace does not disclose making a capacitor in a trench. In addition, Wallace does not, at the very least, suggest or disclose *depositing an amorphous silicon nitride layer over the continuous crystalline silicon nitride layer...to form a node dielectric,* as essentially claimed in claim 10.

Although, Wolf discloses forming a deep trench structure, Applicants respectfully submit one of ordinary skill in the art would not be motivated to combine the teachings of Wallace with Wolf because Wolf does not disclose or suggest, or even remotely concerned with, forming a crystalline silicon nitride layer within a deep trench as a node dielectric. Nor does Wolf cure the deficiencies of Wallace because Wolf does not suggest or disclose *depositing an amorphous silicon nitride layer over the continuous crystalline silicon nitride layer,* as essentially claimed in

claim 10.

Therefore, one of ordinary skill in the art would not be motivated to combine the teachings of the cited references because neither Wolf or Wallace disclose or suggest the elements as claimed in claim 10.

Even assuming, *arguendo,* that Wolf could be properly combined with Wallace, it is respectfully submitted that the combination of Wolf and Wallace is legally deficient to establish a prima facie case of obvious because, at the very least, the combination does not suggest or disclosed a method for forming a node dielectric layer in deep trenches comprising, *inter alia, depositing an amorphous silicon nitride layer over the continuous crystalline silicon nitride layer...to form a node dielectric.*

Further, claims 2-8 depend from claim 1, claims 11-16 depend from claim 10, and claims 22-28 depend from claim 21. Therefore, the dependent claims are allowable for at least the same reasons as the independent base claims 1, 10, and 21. Accordingly, the withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Respectfully submitted,

By: Frank V. DeRosa
Reg. No. 43,584
Attorney for Applicant

F.CHAU & ASSOCIATES, LLP
1900 Hempstead Turnpike, Suite 501
East Meadow, NY 11554
Telephone: (516) 357-0091
Facsimile: (516) 357-0092